

**EXPOSURE CONTROL FOR PHASE SHIFTING PHOTOLITHOGRAPHIC MASKS****ABSTRACT**

Mask and integrated circuit fabrication approaches are described to facilitate use of so  
5 called "full phase" masks. This facilitates use of masks where substantially all of a layout is  
defined using phase shifting. More specifically, exposure settings including relative dosing  
between the phase shift mask and the trim masks are described. Additionally, single reticle  
approaches for accommodating both masks are considered. In one embodiment, the phase  
shifting mask and the trim mask are exposed using the same exposure conditions, except for  
10 relative dosing. In another embodiment, the relative dosing between the phase and trim patterns  
is  $1.0:r$ ,  $2.0 < r < 4.0$ . These approaches facilitate better exposure profiles for the resulting ICs  
and can thus improve chip yield and increase throughput by reducing the need to alter settings  
and/or switch reticles between exposures.

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